

Qualitative Evaluation of Hospital Menus

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ABSTRACT

Study design: Cross-sectional, qualitative study. **Objectives:** To qualitatively evaluate the menu preparations offered at hospitals from the city of Uberaba - MG. **Methods:** The analysis was conducted using the method "Qualitative evaluation of menu preparations" to evaluate lunch menus offered at 5 Food and Nutrition Units from public or private Hospitals for 3 weeks alternated between February and June 2018. The offer of fruits, leafy vegetables, sweets, fried food, fatty meats and fried food + sweets in the same meal were evaluated, as well as the color repetitions and the presence of sulphurated food. **Results:** Items rated as "Excellent" showed low offer of fried food (6.7%), fatty meats (8.0%) and no offer of sweet + fried food on the same day (0%); "Good" showed the offer of leafy vegetables (75%) and sweets (22.7%); "Regular" indicated color repetition (42.7%); "Bad" indicated sulphurated food (56%) and "Very bad" stood for fruit offer (9.3%). **Conclusion:** The menus had positive aspects such as the absence of sweet + fried food, low presence of fried food and fatty meats, good offer of leafy vegetables and sweets. The worrying aspects were associated with color repetition and the negative aspects were related to the presence of sulphurated food and absence of fruits.

Keywords: Menu, Hospital food service, Menu planning.

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INTRODUCTION

The Hospital Food and Nutrition Units (FNU), also known as Nutrition and Dietetic Service (NDS) is responsible for providing balanced and safe meals, for maintaining, recovering, and enhancing the health of the sick population, as well as the healthy population comprising employees and patients' caregivers^{1,2}.

The menu is thus a fundamental tool for the meal planning³ and must be developed by nutritionists in order to offer meals that consider eating habits, nutritional characteristics, and adequacy to the supply market and to the local production capacity⁴. The importance of correct planning is highlighted, since the failure in the menu preparation can interfere with the quality of the served meals, resulting in monotonous and unattractive preparations due to repetition and unbalance in terms of nutritional aspects⁵.

Among the methods used to assist the planning of the menu, the "*Qualitative evaluation of menu preparations*" (QEMP) has received much attention as it proposes the evaluation of colors, preparation techniques, repetition, combinations, offer of leafy vegetables, fruits, meat type and presence of sulphurated food^{6,7}. Such evaluation makes it possible to go beyond the quantitative analysis, as it encompasses nutritional and sensory quality in face of the scientifically recommended health parameters^{6,8}.

METHODS

This is a cross-sectional and qualitative study conducted from February to June 2018.

The detailed daily analysis of the menus from five public or private hospitals in the city of Uberaba (MG) was carried out along three alternate weeks (except for Saturdays and Sundays), respecting an interval of one month between them. Only preparations served at lunch for patients with a general diet, caregivers and employees were evaluated.

The method adopted is the one developed by Veiros e Proença (2003) named Qualitative Evaluation of Menu Preparations (QEMP), which considers the following items: fruits, leafy vegetables, color repetitions, the presence of sulphurated food,

sweets, fried food by immersion (as a preparation technique), presence of fatty meats, fried food and sweets in the same meal. Subsequently, we identified the most common preparations, the most used techniques, and the most evident colors of the menus from each hospital food and nutrition unit (FNU) during the period of three weeks.

For analyzing preparations rich in sulphurated ingredients, we considered the use of flatulent food, rich in sulfur, such as avocado, chard, celery, garlic, peanuts, sweet potatoes, broccoli, chestnuts, onions, Brussels sprouts, cauliflower, peas, ginger, guava, jackfruit, lentil, apple, watermelon, melon, corn, mustard, turnip, walnuts, egg, radish, cabbage and grapes. Beans were excluded for being a basic ingredient in the Brazilian culture⁹.

With respect to repetition of colors, the term "monotonous" was regarded when preparations had the same color or similar colors in the same day⁹.

Preparations with fatty meats as the main course included: chuck, neck steak, rib steak, striploin, ribs, processed meats (sausages, burger steak), flank steak, shoulder clod, neck, sirloin cap, short ribs, viscera and feijoada (stew of beans with beef and pork, which is a typical Brazilian dish)¹⁰.

The presence of fruits, sweets, fried food, leafy vegetables and fried sweets was also examined.

The evaluation of the menu was carried out observing the percentage of daily occurrence of the ingredients and preparations related to each criterion mentioned above. Some items were regarded as positive aspects of a menu while others were considered negative aspects.

The offer of fruits and leafy vegetables was considered a positive aspect, and based on their percentage of occurrence, these items were rated as: Excellent ($\geq 90\%$), good (75 to 89%), regular (50 to 74%), bad (25 to 49%) and very bad ($< 25\%$)¹¹.

Same color food, sulphurated food, sweets, fried food, fatty meats and offer of sweet + fried food at the same day were considered negative aspects of a menu, according to the following criteria: Excellent ($\leq 10\%$), good (11 to 25%), regular (26 to 50%), bad (51 to 75%) and very bad ($>75\%$)¹¹.

Data were analyzed from a spreadsheet in which variable responses of frequency indicated the presence or not (percentage of occurrence) of each item, at each week and at each hospital. The percentage of occurrence of the most common preparations, colors and techniques was also

considered. For comparing the items between the hospitals, the variables "leafy vegetables", "same colors", "sulphurated food" and "sweets" were categorized in cross tables. The variables were coded 0 (for the absence of the item in the menu of each hospital on a given day) or 1 (for the presence of the item), with each of the five hospitals considered a variation factor. Fisher's exact test was applied considering a significance of 5% (p -value $<0,05$). For the other items, the respective cross tables were not created for they were present in less than 10% of the analyzed days, therefore, they were considered insignificant. Data were analyzed using the *SPSS software (Statistical Package for the Social Sciences)* version 23.0. As we are addressing menu preparations, there was no need to submit the project to the Research Ethics Committee.

RESULTS

The menus in Table 1 show that hospitals work similarly regarding some of the items.

According to the pre-established criteria, which defines the negative aspects, none of the menus was considered "Excellent" (occurrence $<10\%$), however, it stood out the absence of the combination sweet + fried food (0%), the low percentage of fried food (6,7%) and fatty meat (8,0%). Moist heat was the most used cooking technique at the five hospital FNUs, and, of these, four had beef as the most frequent preparation (Table 2)

The offer of sweets (22,7%) was considered "Good" (11 to 25%), and only the hospital facilities 04 and 05 offered it. Banana sweet and gelatin were the most frequent. The monotony of colors was rated "Regular", and the offer of sulphurated food was rated "Bad"

As for the monotony of colors (42,7%) in the menus (Table 1), the hospital FNUs were rated Regular (26 to 50%). The most frequent same-colors were brown, white, green and red, which were present almost every day (Table 2).

The item listed as Bad (51 to 75%) refers to the offer of sulphurated food (56,0%), shown in Table 1. This is because the high level of sulphurated compounds can cause flatulence and thus gastrointestinal discomfort⁷.

According to the pre-established criteria for the positive aspects of a menu, the percentage of leafy vegetables (75%) was considered "Good" (75

to 89%, described in Table 1), lettuce being the most frequent option (Table 2). The offer of fruits (9,3%) was rated "Very Bad" ($<25\%$), as it is offered at only two hospital FNUs, with bananas being the most frequent option, followed by oranges and watermelon (Table 2).

Figure 1 allows us to compare, between the hospitals, the offer of some items such as leafy vegetables, same colors, sulfur-rich food and sweets that were present in more than 10% of the observed days. Differences could be noticed in the offer of leafy vegetables between the hospital Food and Nutrition Units (p -value= $0,005$). The proportion of leafy vegetables at FNU 02 (40,0%) is different from FNU 03 (93,3%) and 05 (93,3%), which had equal percentage, whereas hospitals 01 (66,7%) and 04 (80,0%) were not different from any of the other hospitals.

Percentage of occurrence in relation to the total number of days. Source: The Authors, 2018

Differences were also observed for the variable "same colors" (p -value= $0,013$), with FNU 01 (20,0%) different from FNU 04 (73,3%) and the proportions of FNUs 02 (26,7%), 03 (33,3%) and 05 (60,0%) were not considered different from each other and from other hospital FNUs.

Figure 1. Comparison of the offer of leafy vegetables, same colors, sulfur-rich food and sweets at Hospital Food and Nutrition Units (FNUs) in Uberaba/MG – Brazil 2018

Different letters (a,b) in the same criterion indicate significant difference (p -value $<0,05$) between the values observed for the FNUs. Source: The Authors, 2018.

As for the presence of sulphurated food, there was a difference (p -value= $0,000$) in the hospital units 01(40,0%) and 02 (13,3%) compared to the units 03 (86,7%), 04 (73,3%) and 05 (66,7%). The proportions of FNUs 01 and 02 were not different from each other, and the same was observed in the proportions of FNUs 03, 04 and 05.

There were differences between proportions of sweets (p -value= $0,000$), with FNU 04 (80,0%) differing from FNUs 01 (0,0%), 02 (0,0%) and 05 (0,0%). The proportions of hospital units 01, 02 and 05 were not different from each other, and the proportion of sweets at the unit 03 (33,3%) was not different from the other units.

Table 1. Qualitative Evaluation of Menu Preparation (QEMP) at the Hospitals. Uberaba/MG – Brazil 2018.

QEMP	Days	Fruits	Leafy	Same color	Sulfur Food	Sweets	Fried food	Fatty Meats	Sweet + F.F.
Hospital Unit 01									
1st Week	5	0	5	2	1	0	0	0	0
2nd Week	5	0	0	1	0	0	0	0	0
3rd Week	5	0	5	0	5	0	0	1	0
Total/Days	15	0	10	3	6	0	0	1	0
% Occurrence		0,0%	66,7%	20,0%	40,0%	0,0%	0,0%	6,7%	0,0%
Hospital Unit 02									
1st Week	5	0	2	1	1	0	2	2	0
2nd Week	5	0	3	0	1	0	1	1	0
3rd Week	5	0	1	3	0	0	1	1	0
Total/Days	15	0	6	4	2	0	4	4	0
% Occurrence		0,0%	40,0%	26,7%	13,3%	0,0%	26,7%	26,7%	0,0%
Hospital Unit 03									
1st Week	5	0	4	2	5	0	0	0	0
2nd Week	5	0	5	0	5	0	0	0	0
3rd Week	5	5	5	3	3	5	0	0	0
Total/Days	15	5	14	5	13	5	0	0	0
% Occurrence		33,3%	93,3%	33,3%	86,7%	33,3%	0,0%	0,0%	0,0%
Hospital Unit 04									
1st Week	5	0	5	3	3	5	0	1	0
2nd Week	5	1	4	5	5	5	0	0	0
3rd Week	5	1	3	3	3	2	0	0	0
Total/Days	15	2	12	11	11	12	0	1	0
% Occurrence		13,3%	80,0%	73,3%	73,3%	80,0%	0,0%	6,7%	0,0%
Hospital Unit 05									
1st Week	5	0	5	2	5	0	1	0	0
2nd Week	5	0	4	3	0	0	0	0	0
3rd Week	5	0	5	4	5	0	0	0	0
Total/Days	15	0	14	9	10	0	1	0	0
% Occurrence		0,0%	93,3%	60,0%	66,7%	0,0%	6,7%	0,0%	0,0%
AVERAGE		9,3%	75,0%	42,7%	56,0%	22,7%	6,7%	8,0%	0,0%

QEMP= Qualitative Evaluation of Menu Preparations with the percentage of occurrence (frequency of offer in relation to the total number of days). Source: The Authors, 2018.

Table 2. Percentage of occurrence of preparations, colors and cooking techniques most used in hospital menus. Uberaba/ MG – Brazil 2018.

<i>Group</i>	<i>Preparation</i>	<i>Technique</i>	<i>Color</i>	<i>Frequency</i>	<i>% Occurrence</i>
Hospital FNU 01					
Cereals	Simple Rice	Moist Heat	White	15 days	100%
Legumes	Simple Beans	Moist Heat	Brown	14 days	93,3 %
Meat & Eggs	Chopped Beef	Moist Heat	Brown	3 days	20,0%
Vegetables	Lettuce	-	Green	12 days	80,0%
Fruits	Banana	-	White	2 days	13,3%
Hospital FNU 02					
Cereals	Simple Rice	Moist Heat	White	15 days	100%
Legumes	Simple Beans	Moist Heat	Brown	15 days	100%
Meat and Eggs	Chopped Beef	Moist Heat	Brown	5 days	33,3%
Vegetables	Pumpkin	Moist Heat	Orange	6 days	40,0%
Fruits	Banana	-	White	1 day	6,6%
Hospital FNU 03					
Cereals	Simple Rice	Moist Heat	White	14 days	93,3 %
Legumes	Simple Beans	Moist Heat	Brown	15 days	100%
Meat & Eggs	Chopped Beef	Moist Heat	Brown	4 days	26,7%
Vegetables	Lettuce	-	Green	13 days	73,3%
Fruits	Banana	-	White	3 days	20,0%
Sweets & Sugars	Gelatine	-	Red	3 days	20,0%
Hospital FNU 04					
Cereals	Simple Rice	Moist Heat	White	13 days	86,6%
Legumes	Simple Beans	Moist Heat	Brown	13 days	86,6%
Meat & Eggs	False Loin	Dry heat	Brown	3 days	20,0%
Vegetables	Tomato	-	Red	14 days	93,3%
Fruits	Watermelon	-	Red	1 day	6,7%
Sweets & Sugars	Banana Sweet	-	Brown	5 days	33,3%
Hospital Unit 05					
Cereals	Simple Rice	Moist Heat	White	14 days	93,3%
Legumes	Simple Beans	Moist Heat	Brown	15 days	100%
Meat & Eggs	Chopped Beef	Moist Heat	Brown	3 days	20,0%
Vegetables	Tomato	-	Red	4 days	26,7%
Fruits	Oranges	-	Orange	2 days	13,3%

Percentage of occurrence in relation to the total number of days. Source: The Authors, 2018

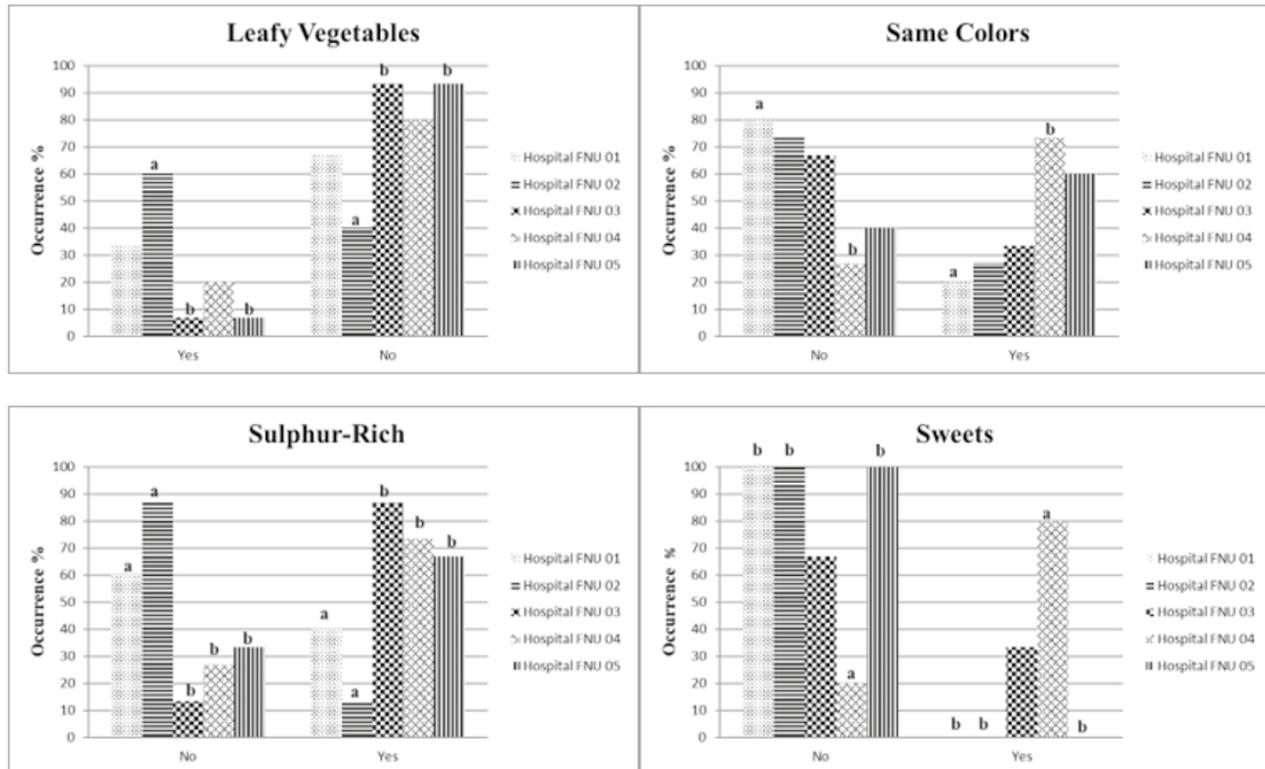


Figure 1. Comparison of the offer of leafy vegetables, same colors, sulfur-rich food and sweets at Hospital Food and Nutrition Units (FNUs) in Uberaba/MG – Brazil 2018

Different letters (a,b) in the same criterion indicate significant difference ($p\text{-value} < 0,05$) between the values observed for the FNUs. Source: The Authors, 2018.

In short, according to the results from the 5 units, the FNU 01 showed the best quality, whereas FNU 04 was rated the worst in terms of the analyzed items. There was a difference between units 03 and 05, which offered more leafy vegetables, and unit 02, which had the lowest offer of such preparation. FNU 01 showed less color repetition while FNU 04 showed the greatest. Units 01 and 02 offered the smallest number of sulphurated foods, whereas units 03, 04 and 05 showed the highest offer. Units 01, 02 and 05 did not offer sweets, whereas 04 was the one which offered the most.

DISCUSSION

Diets can be very varied in a Hospital Food and Nutrition Unit. Important restrictions have to be observed, such as the amount of calories (after bariatric surgery), sodium (hypertensive and renal

patients) and, in the opposite way, hypercaloric diets for cases of burnt and malnourished patients. Therefore, for sick, bedridden or with special needs individuals, it is essential to carefully work on their qualitative and quantitative diet^{12,13}. In this regard, all the hospital FNUs were careful, as none of them used the sweet+fried combination in their menus.

On the other hand, despite their success in the low offer of fried food and fatty cuts of meat, these items were present in the menus. Good sensory quality is the key point for food to be consumed, as human beings do not eat only for nutrition. They also look for food to their liking, regardless of the nutritional value, rejecting some and even refusing to try food that does not match their dietary pattern, their family/cultural heritage or due to psychological problems¹⁴. For that reason, the challenges in hospital diets range from the precise identification of the patients' needs and expectations to the offer of

nutritious, attractive, and tasty products that, above all, contribute to the maintenance and recovery of the nutritional status, rescuing the association of pleasure with food consumption¹⁵.

It should be noted that the offer of fried food implies a greater supply of lipids to the diners. In excess, such consumption can lead to the development/aggravation of diseases, so it is not recommended within a hospital Food and Nutrition Unit, particularly considering clinically decompensating patients^{7,16}. In addition to fried food, the inclusion of fatty meats brings an increase in saturated fat and cholesterol, which can also contribute to the aggravation of illnesses such as obesity, dyslipidemia and cardiovascular diseases¹⁷.

In the study carried out by Prado, Nicoletti and Faria¹¹, the offer of sweets was observed in 35% of the assessed days, rated as "regular", different from the present study, which showed a better result (22,7%). Although the offer of food that increases energy density, such as sweets, can be beneficial in some hospital situations, this decision requires proper attention given the increase in added sugars and fats, and the low level of proteins, fibers, micronutrients, bioactive compounds in foods and water. An increase in the body mass and adipose tissue resulting from nutritional imbalance caused by the high intake of added sugars and lipids can contribute to the development of obesity-related diseases and other noncommunicable chronic diseases^{2,18}.

In another study conducted by Bruto e Bezerra², the total color repetition in the menu preparations assessed was 16,1%, a satisfactory percentage when compared to the 42,7% found in our study. The monotony of colors impairs the visual presentation of the food. Unattractive meals can interfere with one's satisfaction and discourage the appetite to eat¹⁹. Moreover, the diversity of colors is usually associated to a greater variety of nutrients and bioactive compounds in food, responsible for the nutritional and sensory quality of the meals, influencing its flavor and adding important properties for health promotion¹⁰.

Returning to the study by Prado, Nicoletti and Faria¹¹, sulfur-rich food was present in 40,0% of the meals, what can be rated as "regular" – a more positive percentage than the one observed in our study. It is believed that the inclusion of more than

two sulphurated ingredients in the menu is already undesirable⁹.

It is worth noting that beans were not included in the classification of sulphurated foods, for in the Brazilian culture it is present in the everyday meals²⁰. Despite being a nutritious source of protein, rich in carbohydrates and bioactive compounds, it can contribute to gastrointestinal discomfort due to the presence of non-digestible oligosaccharides and sulphurated amino acids, which also increase the production of gases. For that reason, we emphasize the importance of the adequate preparation of beans, which includes soaking, for reducing these compounds. This example stresses the importance of the nutritionist in advising the adequate preparation techniques to ensure the nutritional quality of the meals²¹.

Additionally, it is also important to mention that despite the undesirable effect, particularly in the hospital environment, sulphurated foods also have their positive aspects: they are sources of protein, carbohydrates, micronutrients and bioactive compounds, so they must be part of a healthy and varied diet. They are also good sources of vitamin C and other vitamins such as riboflavin, niacin and thiamin, sources of vitamin A, which encompasses a set of compounds with similar structure and activities that include several carotenoids, retinol and retinal (aldehyde with vitamin A activity), in addition to containing vitamin K1 (phytoquinone) and sulphophane, which are important in food for having anticancer properties²². All these reasons suggest that its consumption should be encouraged, as long as it follows the criteria of healthy eating.

Leafy vegetables are also an interesting choice, as they are tasty sources of various nutrients, fiber and are great allies in the diet of both healthy individuals and sick patients. They also strengthen the immune system and bring other health benefits¹⁸. An observation should be made for those regarded as brassica (rich in sulfur), such as Swiss chard, Brussels sprouts, cauliflower, radish, and cabbage. These leafy vegetables should have a controlled offer at the hospital environment because they cause gastrointestinal discomfort due to the high content of sulphurated compounds⁷.

Furthermore, non-alpha-glucan oligosaccharide, such as raffinose, may be present in legumes such as soybeans and beans, and they are not hydrolyzed

by enzymes from the human digestive tract. When associated with foods rich in sulfur, they make the digestive process difficult²³.

As for the offer of fruits, the investigation conducted by Brito and Bezerra² showed low percentages. This stands out as a worrying factor in the menu since the intake of at least three daily servings of fruits is recommended¹⁸. Low percentages were also observed in our study, with only two Food and Nutrition Units serving it. Fruits are healthy and essential for the proper functioning of the body, as well as excellent sources of fiber, carbohydrates, proteins, vitamins, minerals and bioactive compounds that contribute to the prevention and improvement of pathological conditions. Thus, the consumption of fruits is of paramount importance, as advised by the Food Guide for the Brazilian Population (ed. 2014)^{10, 18}.

When comparing some of the items from the hospital menus, according to the statistical data, the difference in the quality of the menus can be explained by the way each hospital unit carries out its planning. Factors such as cost, number of professionals, physical structure, number of equipment and purchase planning must all be considered and require constant preventive and corrective measures in order to meet the needs involving the menu preparations. This planning makes it possible to avoid problems related to stock and replacements and to keep serving healthy and attractive meals. It eventually supports the nutritionist in his choices and possibilities for preparing appetizing and nutritious meals²⁴. In this sense, the QEMP method made possible a comprehensive analysis of the menus, proving to be a useful tool to identify flaws and to make adjustments, thus contributing so that the meals are not only nutritionally adequate, but also attractive to the diners²⁵.

The nutritional care provided by an institution must, by means of food, alleviate the suffering caused by disease and hospitalization, offering nutritional support and individualized assistance that meets specific nutritional goals²⁶.

CONCLUSION

The qualitative analysis of meals from the hospital menus showed excellent ratings for the

absence of the combination "sweet+fried food", for the low presence of fatty cuts of meat and for the restricted use of frying. The offer of leafy vegetables and sweets was considered adequate. The repetition of colors was rated regular. However, when it comes to the excessive presence of sulphurated ingredients and the absence of fruits, the menus were considered bad and very bad, respectively.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest. .

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